Materials Science and Engineering

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NEW DELHI PUBLISHERS

New Delhi, Kolkata

This First Edition published in 2026

Title: Materials Science and Engineering

Editors: Dr. Apala Bhattacharya and Dr. Bhaskar Jyoti Sarkar

Description: First edition | New Delhi Publishers 2026 | Includes bibliographical references and index.

Identifiers: ISBN 9789349897151 (Print) | 9789349897458 (eBook)

Cover Design: New Delhi Publishers

NEW DELHI PUBLISHERS

Head Office: 90, Sainik Vihar, Mohan Garden, New Delhi, India

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Website: www.ndpublisher.in

Preface

This book is designed to provide valuable knowledge to students and learners in the field of Materials Science and Engineering. As a rapidly evolving and interdisciplinary domain, Materials Science and Engineering involves the study of structures, devices and systems with novel and advanced properties. Rooted in physics, chemistry and engineering, materials science plays a crucial role in advancing nearly every area of modern technology.

This volume, "*Materials Science and Engineering,"* aims to provide readers with a comprehensive overview of the field, covering core principles, recent advances, and emerging trends. The chapters explore essential topics such as crystallography, nanomaterials, biomaterials, computational materials science, optical materials, optical fibres, numerical simulation and phase transitions.

As editors, our objective has been to curate a well-balanced and cohesive resource that serves both as a foundational resource for students and as a valuable reference for professionals seeking deeper insights into material behaviour and applications. Special emphasis has been placed on clarity, accessibility and practical relevance with numerous examples, illustrations and case studies that bridge theoretical knowledge with real-world applications.

We would like to express our heartfelt gratitude to the contributing authors for their expertise and dedication and to the reviewers whose insights have significantly enhanced the quality and precision of this work. We also extend our sincere appreciation to the publishing team for their unwavering support throughout this project.

We hope that this book will not only support academic learning but also inspire curiosity and innovation in the field of Materials Science and Engineering. Whether you are a student beginning your academic journey, a researcher exploring new scientific frontiers, or a practitioner applying materials knowledge to solve complex challenges, this book is for you.

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